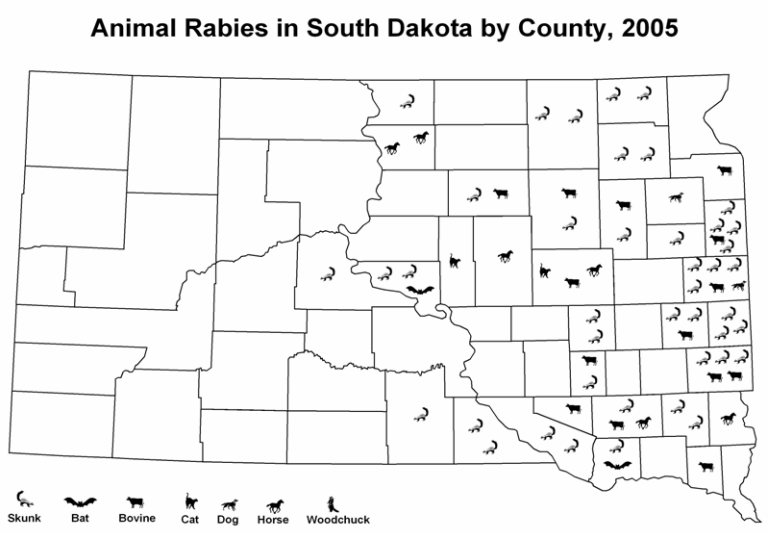
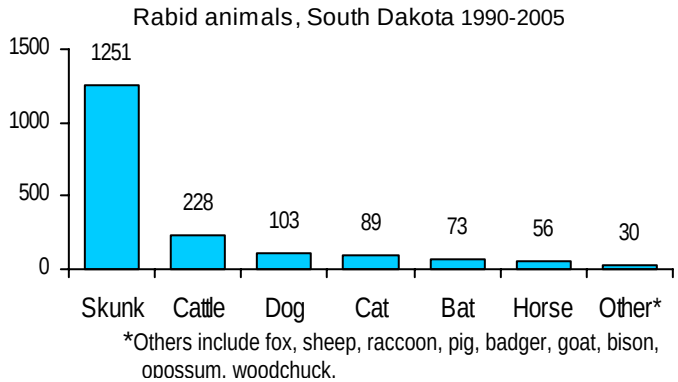
Rabies Surveillance, South Dakota, 2005

Rabies is enzootic in South Dakota. In 2005, 732 animals were submitted for rabies testing with 68 animals testing positive. This was a 28% decrease from the previous year, 2004, when 94 animals tested positive. The 68 rabies positive animals included 44 wild animals (42 skunks and 2 bats) and 24 domestic animals (14 cattle, 6 horses, 2 cats and 2 dogs). There were no human rabies cases in South Dakota in 2005. Our last human case was in 1970.



In 2005 rabid animals were detected in 32 South Dakota counties. Animals were submitted for testing from all counties, except Dewey, Jones, Mellette and Ziebach. From 1990 through 2005, there were 15,893 animals tested for rabies in South Dakota, 1830 of which tested positive (12%). During these years animals were submitted for testing from all counties, and rabid animals were detected in all counties, except Bennett, Shannon, Todd, and Ziebach. Minnehaha County submitted the most animals



Animal rabies cases by County, 1990 – 2005	2005		1990 – 2005		
County	Pos	Neg	Pos	Neg	% Pos
Aurora	0	3	27	95	22%
Beadle	3	11	58	250	19%
Bennett	0	1	0	25	0%
Bon Homme	2	6	14	97	13%
Brookings	6	44	78	716	10%
Brown	2	24	77	472	14%
Brule	0	3	22	138	14%
Buffalo	0	1	6	25	19%
Butte	0	6	38	278	12%
Campbell	1	0	22	64	26%
Charles Mix	2	10	38	196	16%
Clark	2	11	39	112	26%
Clay	1	8	7	138	5%
Codington	1	18	59	344	15%
Corson	0	1	7	24	23%
Custer	0	1	4	49	8%
Davison	2	24	47	466	9%
Day	2	4	53	156	25%
Deuel	5	5	58	267	18%
Dewey	0	0	25	78	24%
Douglas	1	7	25	107	19%
Edmunds	0	3	19	101	16%
Fall River	0	4	4	200	2%
Faulk	2	3	25	63	28%
Grant	1	15	34	230	13%
Gregory	2	7	15	123	11%
Haakon	0	1	9	84	10%
Hamlin	1	10	59	174	25%
Hand	1	4	31	106	23%
Hanson	0	3	14	68	17%
Harding	0	3	11	37	23%
Hughes	3	21	38	334	10%
Hutchinson	3	23	68	306	18%
Hyde	1	5	20	109	16%
Jackson	0	4	2	90	2%
Jerauld	0	9	18	74	20%
Jones	0	0	3	26	10%
Kingsbury	0	7	66	257	20%
Lake	3	14	42	260	14%
Lawrence	0	10	20	190	10%
Lincoln	1	20	14	265	5%
Lyman	0	2	2	63	3%
Marshall	2	3	33	145	19%
McCook	0	7	41	197	17%
McPherson	0	7	35	144	20%
Meade	0	12	29	277	9%
Mellette	0	0	1	18	5%
Miner	0	3	28	106	21%
Minnehaha	5	109	95	2541	4%
Moody	3	7	42	172	20%
Pennington	0	73	46	1181	4%
Perkins	0	3	11	47	19%
Potter	0	1	11	41	21%
Roberts	0	14	47	287	14%
Sanborn	2	2	26	87	23%
Shannon	0	2	0	59	0%
Spink	2	5	28	160	15%
Stanley	1	1	4	26	13%
Sully	0	1	7	19	27%
Todd	0	1	0	91	0%
Tripp	1	12	17	171	9%
Turner	2	13	45	331	12%
Union	0	4	7	145	5%
Walworth	2	21	42	349	11%
Yankton	0	7	17	208	8%
Ziebach	0	0	0	4	0%
South Dakota	**68**	**664**	**1830**	**14063**	**12%**

for testing (2,636) and Ziebach County submitted the fewest (4).

Since 1990, 27% of rabid animal cases in South Dakota have been domestic animals. Rabid livestock included 228 cattle, 56 horses, 6 sheep, 3 pigs, and 2 goats. There have also been 103 rabid dogs and 89 rabid cats, many of which were unvaccinated strays. Of the 74 rabid dogs investigated between 1993 and 2005, 1 dog was fully immunized, 61 had never been immunized, 5 were inadequately immunized, and 6 were of unknown vaccination status.

The common skunk (*Mephitis mephitis*) is the enzootic rabies reservoir in South Dakota. Since 1990, 68% of the skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 73 positive bats since 1990, 3% of the 2,157 bats tested.

Animals tested and confirmed rabies cases, SD, 1990-2005

Animal	2005 Pos	2005 Total tested	1990 - 2005 Pos	1990 - 2005 Total tested	1990 - 2005 % Pos
Skunk	42	62	1251	1830	68%
Cattle	14	122	228	2170	11%
Dog	2	143	103	2979	3%
Horse	6	25	56	364	15%
Cat	2	218	89	4308	2%
Bat	2	99	73	2157	3%
Fox	0	2	8	89	9%
Sheep	0	3	6	167	4%
Raccoon	0	27	3	838	0%
Pig	0	0	3	29	10%
Badger	0	2	3	22	14%
Goat	0	2	2	39	5%
Bison	0	0	2	11	18%
Opossum	0	1	1	66	2%
Woodchuck	0	1	1	17	6%
Shrew or mole	0	0	1	7	14%
Rodents*	0	3	0	448	0%
Deer, elk, donkey,	0	4	0	88	0%
Weasel/ferret/mink	0	2	0	71	0%
Coyote or wolf	0	4	0	57	0%
Squirrel/chipmunk	0	10	0	59	0%
Muskrat	0	0	0	38	0%
Rabbits and hares	0	1	0	16	0%
Bobcat or bear	0	0	0	5	0%
Mountain lion	0	0	0	2	0%
Other animals	0	1	0	16	0%
TOTAL	**68**	**732**	**1830**	**15893**	**12%**

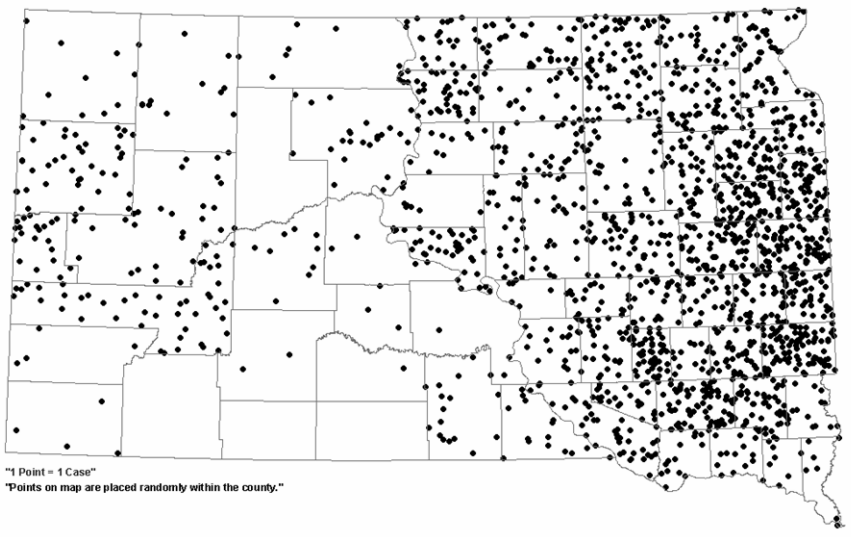
*Rodents: rat, mouse, prairie dog, gopher, beaver, porcupine, vole

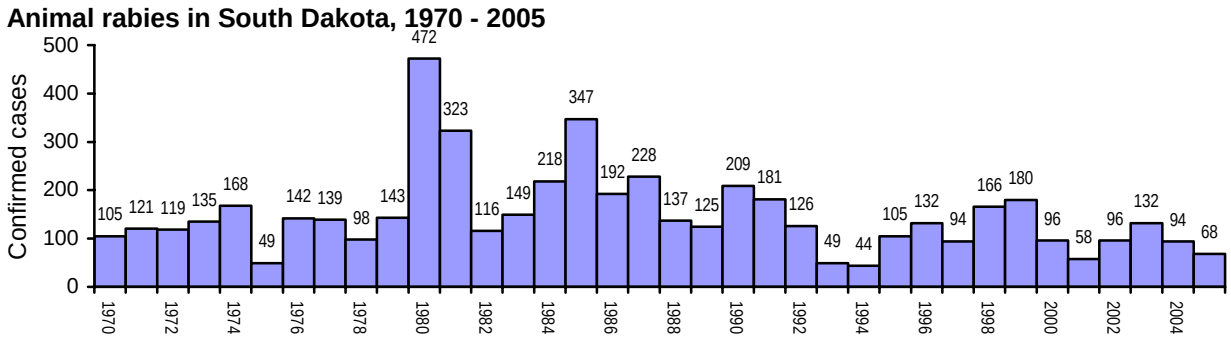
Rabies is not considered enzootic in other wild animals in South Dakota. Since 1990, however, rabies has been detected in 8 foxes, 3 badgers, 3 raccoons, 2 bison, 1 opossum, 1 shrew and 1 woodchuck. These other animals are likely spillover rabies following exposure to rabid skunks.

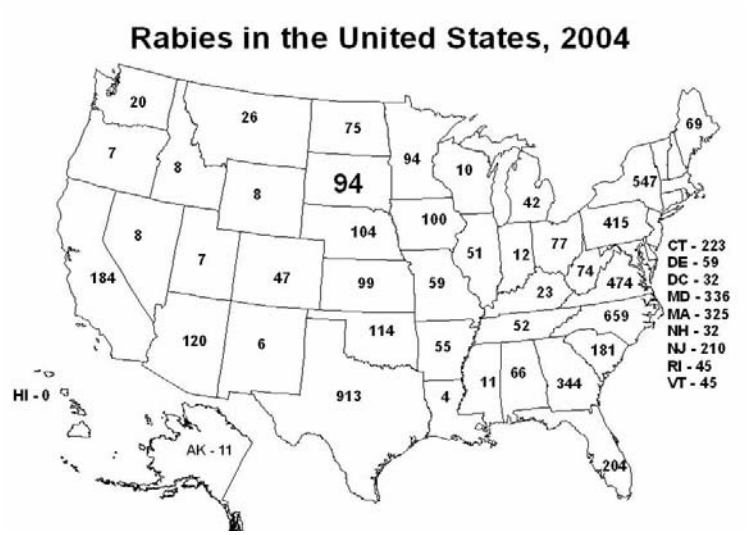
Animal rabies events occur throughout the year in South Dakota, but most rabies events occur during the spring and summer months.

Nationally there have been 21 human rabies cases since 2000 in the United States, 20 deaths and 1 survival. Fifteen of the human cases (71%) have been associated with a bat-rabies virus. A Wisconsin teenager survived bat rabies after receiving experimental treatment.

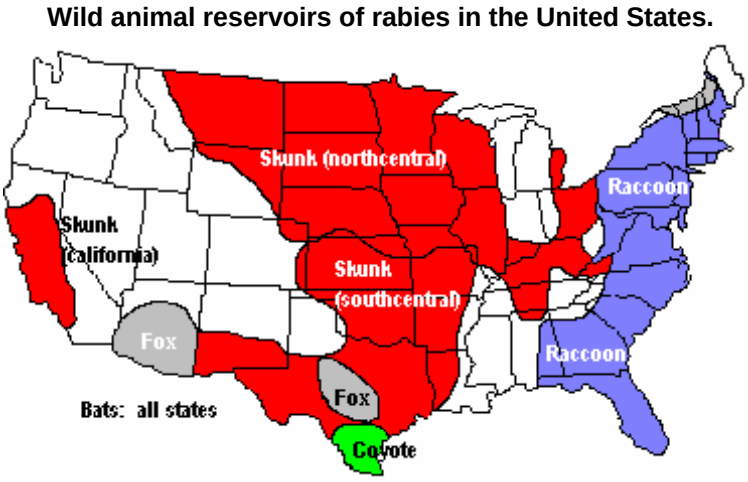
1990 - 2005 South Dakota Animal Rabies Detections







The latest national animal rabies surveillance information is reported for 2004 data (Krebs, et. al., 2005). Nationally, there were 6,836 cases of animal rabies reported in 2004. According to Krebs 92% of the rabies cases were among wild animals and 8% were from domestic animals. Nationally domestic animals included 281 cats, 115 cattle, 94 dogs, 43 horses/mules, 6 goats, 4 sheep and 1 llama. In 2004 South Dakota had 11 rabid cattle, third most in the country. Nationally, wild animals testing positive for rabies included 2,564 raccoons, 1,856 skunks, 1,361 bats, 389 foxes, 47 mongooses, 30 groundhogs, 21 bobcats, 10 deer, 5 coyotes, 2 otters, 2 opossums, 1 beaver, 1 bear, 1 wolf-dog hybrid and 1 ringtail (*Bassariscus*). Krebs notes that "with the exception of 1 groundhog reported by South Dakota (in 2004), all cases of rabies in rodents and lagomorphs were reported by states in which rabies is epizootic in raccoons".



Two laboratories test for rabies testing in South Dakota: (1) the Animal Disease Research Diagnostic Laboratory in Brookings, and (2) the State Public Health Laboratory in Pierre. Both laboratories use the direct fluorescent antibody (DFA) technique. The case definition of a confirmed animal rabies case is a positive DFA test, performed preferably on central nervous system tissue, or the isolation of rabies virus in cell culture or in a laboratory animal. Human serum

rabies antibody titers on previous vaccinated people may be ordered through the Public Health Laboratory.

Rabies consultations are available from the Office of Disease Prevention, South Dakota Department of Health, 7 days a week. Consultations are based on current Centers for Disease Control and Prevention (CDC) recommendations*. We strive to recommend appropriate rabies prevention measures and to minimize unnecessary and inappropriate post-exposure testing and prophylactic treatment.

Addresses, telephone numbers and Websites

Department of Health Office of Disease Prevention
(rabies consultations)
615 East Fourth Street
Pierre, SD 57501-1700
Phone: 605-773-3737; 1-800-592-1861;
after hours cell phone 605-280-4810
Web: www.state.sd.us/doh/Pubs/rabies.htm

Department of Health, Public Health Laboratory
(rabies testing and submitting specimens)
615 East Fourth Street
Pierre, SD 57501-1700
Phone: 1-800-592-1861 or 605-773-3368
Web: www.state.sd.us/doh/Lab/rabies.htm

CDC Rabies homepage:
www.cdc.gov/ncidod/dvrd/rabies/default.htm

Animal Disease Research and Diagnostic Laboratory (rabies testing)
Box 2175, North Campus Drive
South Dakota State University
Brookings, SD 57007-1396
Phone: 605-688-5171
Web: www.vetsci.sdstate.edu

South Dakota Animal Industry Board (livestock and other animal veterinary and regulatory issues)
441 S. Fort Street, Pierre, SD 57501-4503
Phone: 605-773-3321
Web: www.state.sd.us/aib

South Dakota Bat Working Group
http://nat_hist.sdstate.edu/SDBWG/SDBWG.html

References

*Centers for Disease Control and Prevention. Human rabies prevention – United States, 1999: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999; 48 (No. RR-1). www.cdc.gov/mmwr/preview/mmwrhtml/00056176.htm

Centers for Disease Control and Prevention. Compendium of animal rabies prevention and control, 2005: National Association of State Public Health Veterinarians, Inc. MMWR 2005; 54 (No. RR-3). www.cdc.gov/mmwr/preview/mmwrhtml/rr5403a1.htm

Krebs, JW, EJ Mandel, DL Swerdlow and CE Rupprecht. 2004. Rabies surveillance in the United States during 2004. Journal of the American Veterinary Medical Association 275: 1912-1925.

Lon Kightlinger, MSPH, Ph.D.
State Epidemiologist
South Dakota Department of Health

Two rabies laboratories in South Dakota: Brookings and Pierre

Brookings: Submission of rabies specimens to SDSU ADRDL

Box 2175, North Campus Drive
South Dakota State University
Brookings, SD 57007-1396

A. To meet CDC guidelines for rabies testing, it will be necessary to submit the: →ENTIRE brain → with the BRAINSTEM→ FRESH to the SDSU ADRDL (or any other test lab). This will allow for testing of both sides of the brain and brainstem. This negates previous recommendations by the ADRDL to submit half of the brain in formalin. The ADRDL will now formalinize the brain after it arrives at out laboratory. Submit the fresh brain in a Styrofoam insulated cardboard shipping container with adequate ice to keep cold enroute to the lab. Do not freeze the fresh brain.

B. Fill out the standard ADRDL submission form, including the rabies section. You can download it from http://vetsci.sdstate.edu/forms/generalform.pdf A veterinarian must be listed as the referring DVM.

C. As always, the laboratory will not accept LIVE animals for rabies testing. To minimize potential exposure, animals should be euthanized prior to transport to the laboratory. Whole bodies, complete heads, or removed brains are all acceptable specimens at the ADRDL. Our lab personnel will remove brains upon arrival, at no additional charge.

D. Since the FA test is so quick and reliable, after hours testing is rarely required anymore. The FA test is completed the same day, if samples arrive before 2 PM. Lab results are phoned to the referring veterinary clinic. Testing after hours, weekend, or holidays is not available at the ADRDL.

E. The ADRDL is open 8 AM to 5 PM Monday through Friday, except holidays. A SPECIMEN DROP-OFF COOLER is accessible to the public 24 hours a day. Samples can be driven to the lab on nights and weekends, and left in the cooler for testing the next working day. The cooler is adjacent to the loading dock near the NE corner of the lab. The on-call diagnostician can be reached at 605-690-1576.

Animal Health Matters, 2006, Vol 9, Issue 1

Pierre: How to Submit Animal Specimens to the South Dakota Public Health Laboratory for Rabies Testing

615 East Fourth Street
Pierre, SD 57501-1700

1. Call the South Dakota Department of Health to report the possible exposure and to seek guidance in how to submit the animal for testing. Call 800-592-1861 or 605-773-3737 during regular business hours. For emergencies, after hours, on weekends or holidays, call the mobile phone (605-280-4810). Staff will be able to answer questions and concerns. If at all possible, please call before destroying the suspect animal.

2. Call one of the above numbers to make special arrangements for shipping an animal specimen after regular business hours, on weekends or holidays.

3. Notify the South Dakota Public Health Laboratory (SDPHL) of all impending shipments of animal specimens before actual transport. Call the lab at 800-592-1861 or 605-773-3368 during regular business hours. After hours, on weekends or holidays, contact an individual listed in #1.

4. Be careful not to destroy the head of the animal by gunshot or bludgeoning. Take the animal to a veterinarian for removal of the head in order to preserve the brain tissue and prevent unnecessary exposure to a diseased animal.

5. Include with the specimen, a SDPHL submission form with the following information:
- Name and birth date of person exposed (or owner if pet exposure)
-Type of animal and exposure, including exposure date/suspect animal death date
- Symptoms and/or unusual behavior of suspect animal
- Name and phone number of veterinarian or physician

(Submission forms are available from veterinarians or physicians)

6. Wrap animal head carefully and either ship or deliver directly to the lab in an insulated container with ice or ice packs. SPECIMEN MUST NOT BE FROZEN. Transport the specimen by the quickest means possible.

Direct additional questions to SDPHL 605-773-3368.

www.state.sd.us/doh/Lab/rabies.htm

South Dakota Laws Regarding Rabies Control

RABIES CONTROL STATUE: Chapter 40-12 (Section 12-1, 2, 3, 4, 5, 6)

40-12-1. Confinement of animals required in localities where rabies exists -- Neglect as misdemeanor. In localities where rabies exists, the animal industry board may require that any animal deemed likely to spread such disease shall be muzzled, caged, tied or confined in any manner that may be deemed necessary. It is a Class 1 misdemeanor for any owner or person in charge of any animal so ordered to be muzzled, caged, tied or confined, to refuse or neglect to carry out such order.

40-12-2. Destruction of rabid animal required. If the animal industry board determines that rabies exists in any animal, the board may kill such animal and any animal there is reason to believe has been bitten by any animal affected with rabies.

40-12-3. Violation of chapter as misdemeanor. Repealed by SL 1977, ch 190, § 482.

40-12-4. Definition of terms. Terms used in this chapter mean:
(1) "Department," the department of health;
(2) "Owner," any person who has a right of property in a pet, keeps or harbors a pet or who has it in his care or acts as its custodian, or permits a pet to remain on or about any premises occupied by him;
(3) "Pet," any dog, cat or other species of carnivore kept for domestication or display.

40-12-5. Confinement of pet after attack upon person -- Violation as misdemeanor. The department may serve written notice upon the owner of any dog or cat which has attacked or bitten a person to confine the animal at the owner's expense upon his premises or at a city pound or other place designated in the notice for a period of at least ten days after the animal has attacked or bitten any person. The department may examine the animal at any time within the ten-day period of confinement to determine whether such animal shows symptoms of rabies. In the case of any pet other than a dog or cat, which has attacked or bitten a person, the department may serve written notice upon the owner of such animal that the owner shall have the animal euthanized immediately and submit the brain to an approved laboratory for rabies examination. Any owner who fails to comply with a written notice served pursuant to this section is guilty of a Class 1 misdemeanor.

40-12-6. Confinement of pet bitten by animal suspected of having rabies -- Violation as misdemeanor. The department may serve written notice upon the owner of a dog or cat known to have been bitten by an animal known or suspected of being affected by rabies, requiring the owner to confine such dog or cat for a period of not less than six months. However, if such dog or cat had been properly treated with an antirabic vaccine, confinement shall be for a period of not less than three months. In the case of any pet other than a dog or cat, the department may serve written notice upon the owner of such animal that the owner shall have the animal euthanized immediately. Any owner who fails to comply with a written notice served pursuant to this section is guilty of a Class 1 misdemeanor.

SHERIFF: Chapter 7-12 (Section 7-12-29)

7-12-29. Taking and holding animal suspected of being dangerous -- Formal determination -- Disposal of dangerous animal. The sheriff may take possession of any animal suspected of being dangerous. The sheriff may hold such animal until a formal determination can be made of the extent of the danger such animal poses. If the animal has attacked or bitten a human or an animal pet, the formal determination shall include consultation with the Department of Health for the purposes of rabies control. The sheriff may dispose of any animal so determined to be dangerous.

CONTROL MEASURES: Administrative Rule, Article 44:20:03:10

44:20:03:10. Application of public health measures to animals. The department may instruct a person who owns or is in possession of an animal known or suspected to be a carrier of an infectious agent in public health measures for preventing infection and spread of disease. If the department knows or has reason to believe, because of testing or epidemiological information, that an animal is infected with an infectious agent and is a threat to the public health, it may issue a public health notice directing the person who owns or is in possession of the animal to take one or more of the following actions:
(1) To examine or test the animal to determine whether it is infected with an infectious agent capable of causing human disease
(2) To report to an authorized department representative for counseling on methods for preventing transmission of the infectious agent;
(3) To confine or quarantine the animal for the duration of the incubation period or contagious period;
(4) To destroy the animal or provide treatment until it is cured or free from the infection and to follow measures for preventing reinfection;
(5) To cease from specific activities involving the infected animal that endanger the health of others;
(6) To cooperate with the department in implementation of reasonable public health measures.

Health certificate for imported cats and dogs: Administrative Rule, Article 12:68:06:09.

Any cat or dog imported into South Dakota must be accompanied by a health certificate as described in SDCL 40-14-2 issued by a state or federal government veterinary official of the originating state or by a licensed veterinarian. The certificate must state that the animal has not been exposed to rabies, that it is free from signs of any contagious or communicable disease, that it has been currently vaccinated by a licensed veterinarian, the date of vaccination, the type of vaccine used, and the date the animal is due for boostering for rabies immunization.

Rabies Vaccine: What You Need to Know

1. What is Rabies?

Rabies is a serious disease. It is caused by a virus.

Rabies is mainly a disease of animals. Humans get rabies when they are bitten by infected animals.

At first there might not be any symptoms. But weeks, or even years after a bite, rabies can cause pain, fatigue, headaches, fever, and irritability. These are followed by seizures, hallucinations, and paralysis. Rabies is almost always fatal.

Wild animals - especially bats - are the most common source of human rabies infection in the United States. Skunks, raccoons, dogs, and cats can also transmit the disease.

Human rabies is rare in the United States. There have been only 39 cases diagnosed since 1990. However, between 16,000 and 39,000 people are treated each year for possible exposure to rabies after animal bites. Also, rabies is far more common in other parts of the world, with about 40,000 - 70,000 rabies-related deaths each year. Bites from unvaccinated dogs cause most of these cases.

Rabies vaccine can prevent rabies.

2. Rabies vaccine

Rabies vaccine is given to people at high risk of rabies to protect them if they are exposed. It can also prevent the disease if it is given to a person *after* they have been exposed.

Rabies vaccine is made from killed rabies virus. It cannot cause rabies.

3. Who should get rabies vaccine and when?

Preventive Vaccination (No Exposure)

•People at high risk of exposure to rabies, such as veterinarians, animal handlers, rabies laboratory workers, spelunkers, and rabies biologics production workers should be offered rabies vaccine.

•The vaccine should also be considered for:
- People whose activities bring them into frequent contact with rabies virus or with possibly rabid animals.
- International travelers who are likely to come in contact with animals in parts of the world where rabies is common.

The pre-exposure schedule for rabies vaccination is **3 doses**, given at the following times:

Dose 1: As appropriate
Dose 2: 7 days after Dose 1
Dose 3: 21 days *or* 28 days after Dose 1

For laboratory workers and others who may be repeatedly exposed to rabies virus, periodic testing for immunity is recommended, and booster doses should be given as needed. (Testing or booster doses are not recommended for travelers.) Ask your doctor for details.

Vaccination After an Exposure

Anyone who has been bitten by an animal, or who otherwise may have been exposed to rabies, should see a doctor immediately.

- A person who is exposed and has never been vaccinated against rabies should get 5 doses of rabies vaccine - one dose right away, and additional doses on the 3rd, 7th, 14th, and 28th days. They should also get a shot of *Rabies Immune Globulin* at the same time as the first dose. This gives immediate protection.
- A person who has been previously vaccinated should get **2 doses** of rabies vaccine - one right away and another on the 3rd day. Rabies Immune Globulin is not needed.

4. Tell your doctor if . . .

Talk with a doctor before getting rabies vaccine if you:

1) ever had a serious (life-threatening) allergic reaction to a previous dose of rabies vaccine, or to any component of the vaccine,
2) have a weakened immune system because:
   - HIV/AIDS or another disease that affects the immune system,
   - treatment with drugs that affect the immune system, such as steroids,
   - cancer, or cancer treatment with radiation or drugs.

If you have a minor illness, such as a cold, you can be vaccinated. If you are moderately or severely ill, you should probably wait until you recover before getting a routine (non-exposure) dose of rabies vaccine.

If you have been exposed to rabies virus, you should get the vaccine regardless of any other illnesses you may have.

5. What are the risks from rabies vaccine?

A vaccine, like any medicine, is capable of causing serious problems, such as severe allergic reactions. The risk of a vaccine causing serious harm, or death, is extremely small. Serious problems from rabies vaccine are very rare.

Mild problems:

- soreness, redness, swelling, or itching where the shot was given (30% - 74%)
- headache, nausea, abdominal pain, muscle aches, dizziness (5% - 40%)

Moderate problems:

- hives, pain in the joints, fever (about 6% of booster doses)
- illness resembling Guillain-Barré Syndrome (GBS), with complete recovery (very rare)

Other nervous system disorders have been reported after rabies vaccine, but this happens so rarely that it is not known whether they are related to the vaccine.

NOTE: Several brands of rabies vaccine are available in the United States, and reactions may vary between brands. Your provider can give you more information about a particular brand.

6. What if there is a moderate or severe reaction?

What should I look for?

- Any unusual condition, such as a high fever or behavior changes. Signs of a serious allergic reaction can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness.

What should I do?

- **Call** a doctor, or get the person to a doctor right away.
- **Tell** your doctor what happened, the date and time it happened, and when the vaccination was given.
- **Ask** your doctor, nurse, or health department to report the reaction by filing a Vaccine Adverse Event Reporting System (VAERS) form. Or call VAERS yourself at 1-800-822-7967, or visit their website at www.vaers.org.

7. How can I learn more?

- Ask your doctor or nurse. They can give you the vaccine package insert or suggest other sources of information.
- Call your local or state health department (1-800-592-1861 in South Dakota).
- Contact the CDC 1-800-232-2522 or 1-800-232-0233 (Español)
  - Visit CDC's rabies website at www.cdc.gov/ncidod/dvrd/rabies

1/12/06 Vaccine Information Sheet

Department of Health and Human Services
Centers for Disease Control and Prevention
National Immunization Program